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# The American telephone journal

"AS you no doubt know we have recently installed automatic equipment and telephones on our farm lines, and also have installed a C. A. X. to replace a manual exchange at Boston.

This last installation has eliminated all manual equipment from our system.

As manufactures of automatic equipment you no doubt would like to know our reason for this last installation. I am pleased to inform you that our reason for so doing is because of the far superior service that we are able to render our subscribers, and because of the reduction in the cost of operation.

I am now more convinced than ever that automatic equipment will eventually take the place of manually operated exchanges entirely. I have come to this conclusion after 15 years experience in the operation of the automatic plant at Richmond.

To show you popularity of our service we increased our rates on the first of January, and up the present time have a net increase of twenty telephones."

*(Extract from letter from Mr. W. M. Bailey, General Manager of the Richmond Home Telephone Company, Richmond, Indiana.)*

Automatic Telephone

Vol. 10 July-August, 1922 No. 7-8

# Current Events

### C. A. X. Installed at Nixon, Pa.

THAT the citizens of Butler county, Pa., are alive to the importance of modern improvements is shown by the enthusiasm with which they accepted the invitation of the Peoples Telephone Company of Butler, Pa., to become the guests of the company on the evening of July 18th at the inspection and demonstration of the new automatic telephone equipment at Nixon, Pa. The new equipment, a Community Automatic Exchange, was manufactured by Automatic Electric Company and installed under the supervision of Mr. O. A. Black, the local company's operating manager.

At Nixon they have a plot of ground known as the Community Lot, on which has been built a hall, used for meetings of various kinds. At the back of this lot Mr. Black has erected a small building for housing the automatic equipment. Six automatic telephones were installed in the hall for the evening gathering.

Mr. T. M. Baker, Secretary of the Peoples Telephone Company, acted as chairman. In his introductory remarks, Mr. Baker briefly explained the organization of the Peoples Telephone Company twenty-five or more years ago, how they had struggled to build a telephone system that would furnish the best possible service to their subscribers and patrons, and how more recently they had taken over the Burton Telephone Company, making it a part of the Peoples Telephone system, and had installed this new automatic equipment in order that the people of Nixon would have the best telephone service.

Mr. W. S. Vivian, manager of the Department of Public Relations, Automatic Electric Company, Chicago, described the invention of the telephone in 1876 and its development up to the present time.

Following Mr. Vivian's talk, the automatic equipment was inspected and the automatic telephones, which had been set up in the community hall were operated. Refreshments were served by young ladies from the Butler office.

### Long Beach Exchange Cut Over

BY the time this issue of "Automatic Telephone" is in the hands of our readers the telephone subscribers of the Associated Telephone Company at Long Beach, Cal., will be enjoying the benefits of automatic service.

The conversion from manual to automatic operation is scheduled for August 15th. For several months, Automatic Electric Company's installation crew have been at work installing the units and connecting cables and testing the switches. The equipment is divided between the Main office with an installed capacity of 3,800 lines and the East office with an installed capacity of 1,200 lines. The Main office switchboard has been installed in a new building.

Automatic equipment is by no means an innovation to subscribers on the Pacific coast. Indeed, all of the larger cities, including Los Angeles, San Francisco, San Diego, have been partly or wholly equipped for automatic service for many years; and now comes Long Beach to add to the growing list of Californian cities in which the telephone of the present and future fosters civic pride.

### More Bell Exchanges Converted to Automatic

FOUR more exchanges in the Bell system have recently been equipped with Strowger automatic switchboards.

At Syracuse, N. Y., one of the telephone offices is now operating automatically, having been cut over on July 29th. As in the case of most of the partial conversions of Bell city networks, arrangements have been made for the completion of all calls from automatic stations without the necessity of the calling subscriber talking to an operator; this regardless of whether calls are to manual or automatic substations.

On June 10, one of the offices of the five-office network operated by the New England Telephone & Telegraph Co., at Hartford, Conn., was converted to automatic. The new exchange has installed capacity of 4,700 lines.

On May 28, a 3,000-line Strowger automatic switchboard was cut into service at St. Joseph, Mo., by the Southwestern Bell Telephone Co.

A few weeks previous, the exchange at Columbia, S. C., serving 3,500 lines, was also converted to automatic by the Southern Bell Telephone & Telegraph Co.

Other exchanges in the Bell system which are scheduled for conversion to automatic during the coming months include Little Rock, Ark.; Peoria, Ill.; Topeka Kan., and Scranton, Pa.

## Reminiscences of New British 'Phone Director

MR. R. A. Dalzell, whose appointment as Director of Telephones and Telegraphs for the British Post Office was recently announced, related some interesting telephone experiences in an interview a short time back.

"I have seen the development of the so-called 'scientific toy' from the original single cricuit wire with Blake or Hunning's transmitters," Mr. Dalzell is reported as saying, "and without multiple switchboards, through the period of metallic circuits and multiple switchboards, to the central battery, which in its turn is giving place to the automatic system.

"This is being rapidly developed, and I think the future lies largely in that direction. I hope to see the automatic telephone in London begun in my time, but it will be many years before the scheme can be completed."

Reverting to his early experience in the eighties, Mr. Dalzell said that they were then little in advance of the time when only musical sounds could be transmitted by telephone. Under the system of those days this was how one "got through:"

The subscriber pressed a button.

A shutter fell in front of the switchboard operator.

The operator put in a flat plug, which connected the call with a second operator sitting immediately behind.

The second operator then asked for the number, and passed it on to the first.

The first proceeded to "establish the connection,"—provided, of course, that the subscriber had not died in the meantime.

A comparison with the automatically handled call of today should prove interesting.

## Alexander Graham Bell

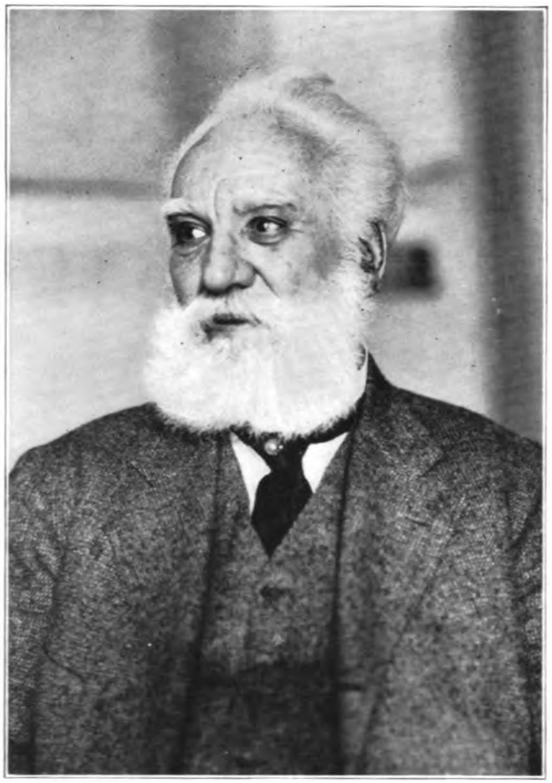
IT is with great regret that we have to record the death of Dr. Alexander Graham Bell, the inventor of the telephone, who died at 2:00 o'clock of the morning of August 2nd at his estate at Baddeck, Novia Scotia. The cause of his death was anaemia.

The announcement of Dr. Bell's death has come as a great shock to the entire telephone world. Not only those who knew him intimately, but everybody who was in any way connected with the industry in whose inception he played so prominent a part, are mourning him as one who served it untiringly and unselfishly.

Dr. Bell was born in Edinburgh, Scotland, in 1849. While still a boy, he undertook to perform numerous experiments in speech and voice transmission, and as he worked he began to see the possibility of conveying speech over an electrically charged wire. Continuing his efforts with the utmost enthusiasm, he finally succeeded in transmitting intelligible sounds over wires reaching between distant points.

While Dr. Bell will be best remembered as the inventor of the telephone, a claim that has been sustained through many a legal contest, he also became noted for other inventions, as a result of which he has been the recipient of a great many honors, both in this country and abroad.

It is difficult to realize that it is less than fifty years since Dr. Bell conducted his first experiments, but is pleasant to recall that he lived long enough to see a complete triumph of his work.



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**Alexander Graham Bell**
**1849-1922**

## Maintenance Costs at Norfolk

AN interesting report has recently been received from the Chesapeake and Potomac Telephone Company concerning trouble data and maintenance costs in the 11,500 line automatic exchange at Norfolk, Va. This report is just another piece of evidence of the extremely low operating costs in automatic exchanges, especially when the standard routines recommended by Automatic Electric Company are followed to the letter, as has been the case at Norfolk continuously since the completion of the installation.

The immediate Norfolk area has 11,500 lines of full automatic equipment installed, and all "per line" labor costs are figured on that basis, since the standard routines provide that all lines, whether in use or not, be maintained to the same standard as lines in service, thereby prolonging the life of the equipment and assuring readiness for service at all times.

Following is a table showing the numbers of lines and stations in the various offices of the district:

| | Lines | | Stations | |
|---|---|---|---|---|
| | Automatic | Manual | Automatic | Manual |
| Norfolk | 10,008 | 644 | 15,630 | 3,144 |
| Berkley | ..... | 778 | ..... | 1,194 |
| Portsmouth | ..... | 2,428 | ..... | 4,616 |
| Ocean View | ..... | 246 | ..... | 281 |
| Virginia Beach | ..... | 137 | ..... | 164 |
| Total | 10,008 | 4,233 | 15,630 | 9,367 |

In addition to the 11,500 lines of full automatic equipment, there is installed:

300 paystation lines.
3 groups of connectors for paystations.
34 manual positions (exclusive of toll) for information, complaint, two-number toll and rural.

The manual lines in Norfolk proper are pay stations, P. B. X. stations, and a few four-party lines that were not cut to automatic. To maintain all of the automatic and manual equipment outlined above, together with its associated power equipment, the following staff is employed.

Supervision of Dist. Wire Chief (half time).
One C. O. Wire Chief (half time).
Five Switchmen.
Four Routine Men.
One Head Switchman.
One Power and Manual Maintenance Man.
One Emergency and Relief.

The average wage of the switch force is $31.62 per week, or on a basis of 11,500 lines, about $1.98 per line per year. This figure includes the maintenance of the manual equipment, although no credit is taken for it in the number of lines.

The trouble and complaint report shows that the total complaints and troubles of all kinds and from all sources, both inside and out, average about 4,000 per month, or about .227 per station per month. Of these, the number of cases that may be traced to switch trouble amount to less than ten per cent, or about .02 cases per station per month.

In comparing such data, it should be remembered that the Norfolk installation is a somewhat large and complex one, and that for a smaller office, the costs would be lower, due to the much smaller amount of trunking equipment required.

# Some Comments on Automatic Service at Miami

### *Telephone Subscribers at Miami, Fla., Express Great Satisfaction with the Improvement in Service Since the Installation of the Strowger Automatic System*

ANY telephone man that has any lingering doubts as to the preference of telephone subscribers regarding automatic and manual service will be interested in the numerous letters received by the South Atlantic Telephone and Telegraph Company from their subscribers at Miami.

While these comments were frankly solicited by the telephone company, in a circular letter addressed to each subscriber by the president, Mr. Frank B. Shutts, they are none the less a faithful representation of the actual sentiment of the telephone users of the city. The purpose of the company in securing these expressions of opinion was plainly stated by Mr. Shutts in his circular letter, which reads in part, "I am keenly interested in seeing that our patrons receive satisfactory telephone service, and that their contact with the organization will be pleasant and advantageous.

"It would be interesting and helpful to me in the administration of the affairs of the Telephone Company, to have some expression from you at this time as to your experience with the new automatic service; and also regarding your dealings with the company generally. If you have any grievances, I should like to know about them now."

It is a significant fact that, in reply to Mr. Shutts' inquiry regarding grievances, the very few subscribers that had complaints to make at all, made no unfavorable comments on the change to automatic service, but rather complained of out of order conditions, which may be expected to occur in telephone systems of all kinds.

Following are extracts from some of the letters received:

CLAUSSEN INVESTMENT COMPANY

Miami, Fla., March 17, 1922.

Mr. Frank B. Shutts, President,
South Atlantic Tel. & Tel. Co.

Dear Mr. Shutts:

I wish to inform you that in my opinion, the installation of the new automatic system here in Miami was an event of such importance that it will remain as an everlasting memory to us all as one of the foremost important improvements made by any public service corporation since the dating of the Charter of the City of Miami.

I consider the system unique and perfect in its every detail, and most certainly a great improvement over the former service. As to public opinion, its installation is a great success, proven by the many compliments which have been given (to my personal knowledge) and not one single objection.

I thank you for giving me the opportunity of writing you this letter. It is a pleasure for me to do so.

With kind regards, I am,

Sincerely yours,
JOHN W. CLAUSSEN.

BURDINE AND QUARTERMAIN

Miami, Fla., Feb. 28, 1922.

Mr. Frank B. Shutts, Pres.,
Miami, Fla.

Dear Sir:

Replying to your letter of the 24th, it is very gratifying to state that if it had been necessary to spend twice the amount of money to put in the automatic telephone, it would justify the price, for we find it very efficient, and a wonderful time saver. We are able to get a connection in a much shorter time than it formerly took us to get the operator.

We have found very little trouble and that was always quickly repaired by reporting it to the complaint clerk. We are unable to offer any suggestions or criticisms because we think the system is almost perfect.

Yours very truly,
M. O. FULLAM, Manager.

DR. LAYMON'S DENTAL INSTITUTE

Miami, Fla., Feb. 28, 1922.

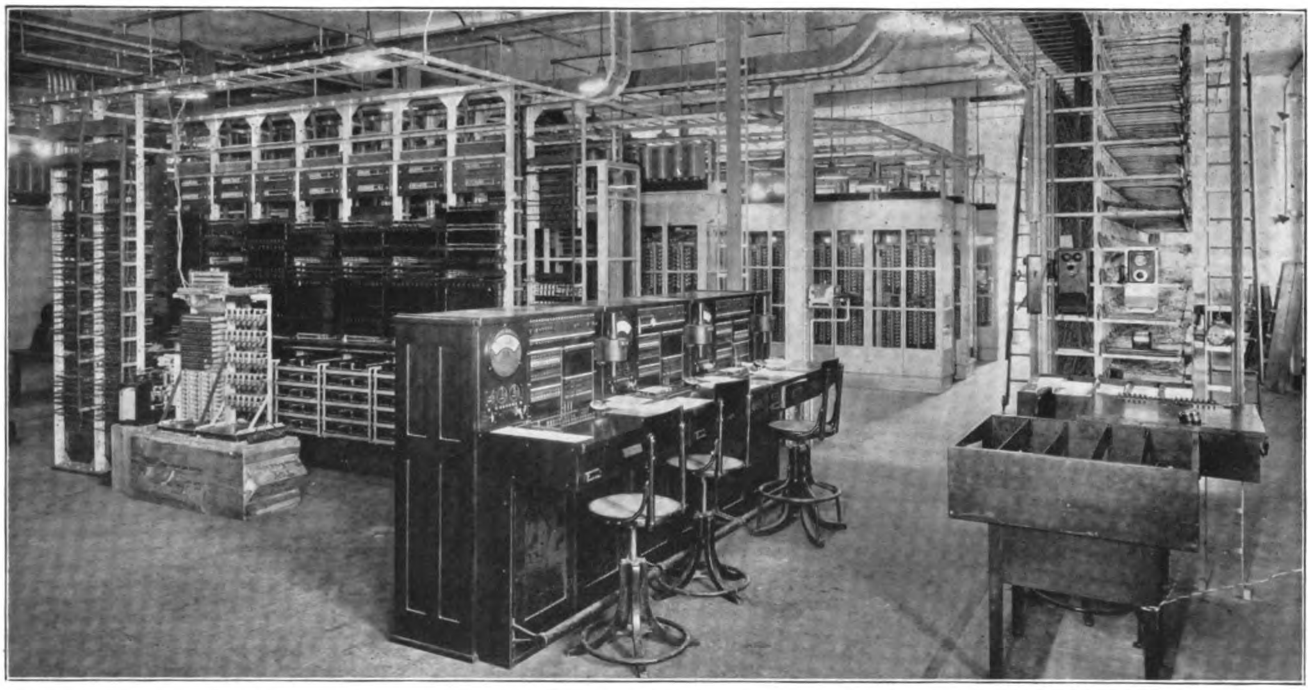
Frank B. Shutts, President,
Miami, Fla.

Dear Mr. Shutts:

It is an old and true saying that "he is my best friend who, seeing my fault, helps me to correct it." I'll have to demonstrate my friendship in some other way this time because for the life of me, I cannot think of a single fault with the new automatic telephone system, its managers or operators.

On the contrary, I am thinking just now of how much time I have saved already in "dialing" with the new system, and annoyance in the unavoidable misunderstanding of the old "number, please" system.

Instantly yours,
CHAS. B. SALA.



**Miami's Automatic Installation That Is Responsible for the Comments Reproduced Herewith**

THE CITY OF MIAMI, INC.
DADE COUNTY, FLA.

Miami, Fla., Feb. 22, 1922.

Mr. Frank B. Shutts, President,
So. Atlantic Tel. & Tel. Co.,
Miami, Fla.

Dear Sir:

In my opinion and experience in its use, the automatic system is entirely satisfactory. * * * The only trouble I experienced under the old system was a misunderstanding of the numbers called for, and occasionally giving the wrong number.

Being a Georgia Cracker, it was a very difficult matter for me to roll my "R's" sufficiently for the ears of some of your operators. The automatic system makes no distinction between a Georgia Cracker and an Indiana Hoosier. * * *

Very truly yours,
CHAS. W. MURRAY,
Director Public Service and Welfare.

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LINDSAY LUMBER COMPANY

Miami, Fla., Feb. 20, 1922.

Mr. Frank B. Shutts, President,
South Atlantic Telephone & Telegraph Co.,
Miami, Fla.

Dear Sir:

Replying to your letter of Feb. 16 regarding telephone service, we are pleased to be in position to express our entire satisfaction with the working of the new automatic system. * * * We believe we have had no single instance where we could complain and the service is much more prompt than under the old method.

We might add that, if we wanted to look around carefully for a complaint, we might let it rest on the name of your company. Should we ever be late with our remittance, it may be because we do not have the time to write your name on the check; or, perhaps, because we ran out of ink.

Yours very truly,
GEO. R. LINDSAY.

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THE CITY OF MIAMI
DADE COUNTY, FLA.

Miami, Fla., Feb. 21.

Mr. Frank B. Shutts, President,
South Atlantic Telephone & Telegraph Co.,
Miami, Fla.

Dear Sir:

I just called up my central operator at the fire station, and asked him what he thought of the new system as compared with the old system. Without hesitation, he exclaimed, "Five hundred per cent better!" If you are good at figuring percentage, you will know that either the present automatic system is mighty good, or that the old system was pretty darn rotten. * * *

Very truly yours,
F. H. WHARTON,
City Manager.

---

McKINNON HOTEL

Miami, Fla., Feb. 23, 1922.

Mr. Frank B. Shutts,
City.

Dear Mr. Shutts:

Yours 16th inst.

The difference between the old and new telephone systems is just that between cursing and blessing.

I believe every one feels likewise.

Very truly yours,
GEORGE A. McKINNON.

---

HARRY E. PARKER

753 S. W. 1st St., Miami, Fla., March 3, 1922.

Mr. Frank B. Shutts, Pres.,
So. Atlantic Tel. & Tel. Co.,
Miami, Fla.

Dear Sir:

While I have never had any fault to find with the telephone service, the new automatic service is a great improvement. It is simple to operate, accurate in its results, and both a time and patience saver. It seems to be as nearly "fool-proof" as any mechanical device can be.

Personally, I feel that the rates are reasonable for the service rendered, and the company seems to be a little ahead of the times by the installation of the new system.

Very truly yours,
HARRY E. PARKER.

WATERS REALTY COMPANY
Miami, Fla., March 1, 1922.
Mr. Frank B. Shutts, President,
South Atlantic Telephone and Telegraph Co.,
Miami, Fla.

Dear Sir:

* * * We are more than pleased with the new system. It is a great time saver. When the number we want is not busy, we get it quickly, without vexatious loss of time in waiting to give the number to central, and then waiting for her to ring one, two or more times; and, on the other hand, when the number is busy, we know it in an instant. We would indeed deplore any thought of returning to the old manual system.

Yours very truly,
R. V. WATERS.

GENTILE BROS. COMPANY
FRUITS AND VEGETABLES
Miami, Fla., March 3, 1922.
Mr. Frank B. Shutts, President,
South Atlantic Telephone & Telegraph Co.,
Miami, Fla.

Dear Sir:

I am very much pleased with the new arrangement and do not know of anything that I could suggest in the way of improvement in the service as it now stands. I find that I can transact business in half the time that it took under the old system. The only drawback that I can think of at the present time is that if I make a mistake and dial the wrong number, there is no way for me to pass the buck. This makes me very careful, and so far I have only made one mistake, which I think is doing very well considering the newness of the system.

* * * It may be that the new system has imbued all parties with the desire to be on the job; at any rate the system is O. K. from start to finish. In making this statement I think the whole town will bear me out.

Yours truly,
M. C. HARDEE.

## Meeting of Society of Automatic Telephone Engineers

THE second meeting of the Society of Automatic Telephone Engineers, the professional body recently organized by the engineers of Automatic Electric Company, was held Thursday evening, June 15, at the West Side Y. M. C. A., Chicago. An enjoyable supper was served before the meeting, which was attended by about seventy members and associates.

Mr. T. G. Martin, Chief Engineer of Automatic Electric Company, gave a very interesting talk on the pioneer period of the automatic telephone industry, sketching the gradual development of the Strowger system and outlining a few of the many difficult problems which were continually arising during that stormy period of the company's career.

Mr. Ralph W. Engsberg presented a paper on "Automatic Equipment in the Sydney, Australia, Network," which precipitated a lively discussion of the keyboard calling device and other features peculiar to the Sydney network.

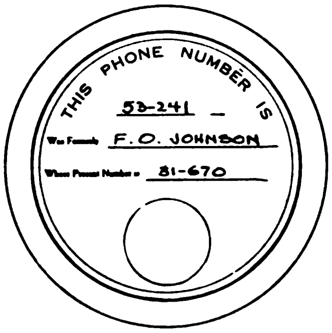
The question box was handled by Mr. E. R. Neir, Factory Manager, who courageously undertook to render impromptu answers to any and all technical questions.

President F. R. Quayle announced that no regular meetings will be held during July and August; the next meeting will be held sometime in September, the date to be announced later.

## Handling Changed Numbers

THE Citizens Telephone Company, Grand Rapids, Mich., uses a very interesting plan for helping to take care of changed or discontinued numbers between issues of directories.

Whenever a telephone number is changed, or service to a subscriber discontinued, a card similar to the one illustrated is filled out and attached to the transmitter of the telephone. When it is desired to reach the previous subscriber and the old number (still appearing in the directory) is dialed, the new subscriber is able to refer the calling party immediately to the proper number, or to advise him that service to such subscriber has been discontinued.



This plan assists materially in handling such traffic between directory issues, without the use of a line I. D. F., and helps to reduce to a minimum the amount of idle line equipment. It also makes special changed number trunks to the information operator unnecessary.

## Making Patrons Stockholders

ONE of the hopeful signs of the times in public utility management is the increasing tendency towards the enrollment of patrons in as large numbers as possible among the stockholders.

Realization is being forced on the managers of many telephone companies that if a man owns stock in a company, and receives dividend checks regularly, he is not nearly so likely as otherwise he would be to protest against the seemingly ever-increasing price he has to pay for the service. The more widely telephone stock is distributed among subscribers of a company, the fewer will be the objections made against the accounts rendered. Herein is food for thought for those companies that feel that their rates are still inadequate, or who have antagonized their subscribers by recent rate increases.

# How Automatic Equipment is Serving the Sydney, Australia, Network

### *A Paper Presented at a Meeting of the Society of Automatic Telephone Engineers at Chicago, on Thursday, June 15th, 1922*

By R. W. ENGSBERG
Equipment Engineer
Automatic Electric Company

IT was about twelve years ago that the first serious consideration was given to the plan calling for the adoption of Automatic equipment for the telephone exchanges of the Sydney, Australia, network. At that time there were in operation in that city a total of 36 manual exchanges, most of them of the magneto type.

All service from these exchanges was rendered on a flat rate basis, and the area covered by such service was roughly forty miles square, although in a few instances, a range approaching one hundred miles was covered within that area.

## SINGLE WIRE LINES

A large number of the lines were operated on a single wire, in many cases a single cable pair being split to serve two lines. These and a few other similar conditions that prevailed meant that the quality of service left much to be desired.

In 1910 and 1911, plans were drawn up for the establishment of a complete network of automatic exchanges for the Sydney area. To serve the purposes of this plan, the total area was divided into ten geographical districts, each of which was to contain a switching center or main exchange, and branches and sub offices as required. The land formation is somewhat peculiar, because of the many bays and harbors, so that not all of the districts are of equal size either in area or in the number of subscribers served, but are natural geographic divisions.

To each of these areas a letter is assigned, and a corresponding letter is used as the first digit of each telephone call number of the area. The letters assigned to the various finger holes of the dial are as follows: 1-A, 2-B, 3-F, 4-J, 5-L, 6-M, 7-U, 8-W, 9-X and 0-Y. The corresponding exchange areas are Randwick, City North, Edgecliff, North Sydney, Newton, Glebe, Ashfield, Balmain, City South and Mosman. The locations of these can be seen from the accompanying map. This original numbering scheme has been maintained practically unchanged through the transition period to the present time.

The details of the development of this network form an interesting story, but because of the limited scope of this paper, only the present status of its development will be dealt with.

## KEYBOARD CALLING DEVICES

There are now installed a total of twelve automatic exchanges, of which six are main offices and six are branch or selector repeater offices. In addition, one office, City, has been equipped with first selectors for use with keyboard calling devices, and with incoming selectors for a branch office, Vaucluse. City office is also equipped with second selectors for trunks incoming from other offices to Vaucluse.

This is an excellent example of a partially equipped automatic office, in that it is equipped with all the necessary in and out trunking equipment, which can all be put to use at a later date when this office is converted to full automatic.

A brief consideration of one of the areas will give us a picture of the general scheme of the network. Ashfield area is a typical example, and contains the following offices: Ashfield (main), Burwood, Homebush, Lidcombe, Parramatta and Liverpool. At the present time, all of the above offices except Liverpool are automatic.

Ashfield is equipped with first, second and third selectors and connectors, with trunks to the main office of each district from levels of first selectors. Trunks to each of the Ashfield area branch offices are taken from second selector levels in the Ashfield office.

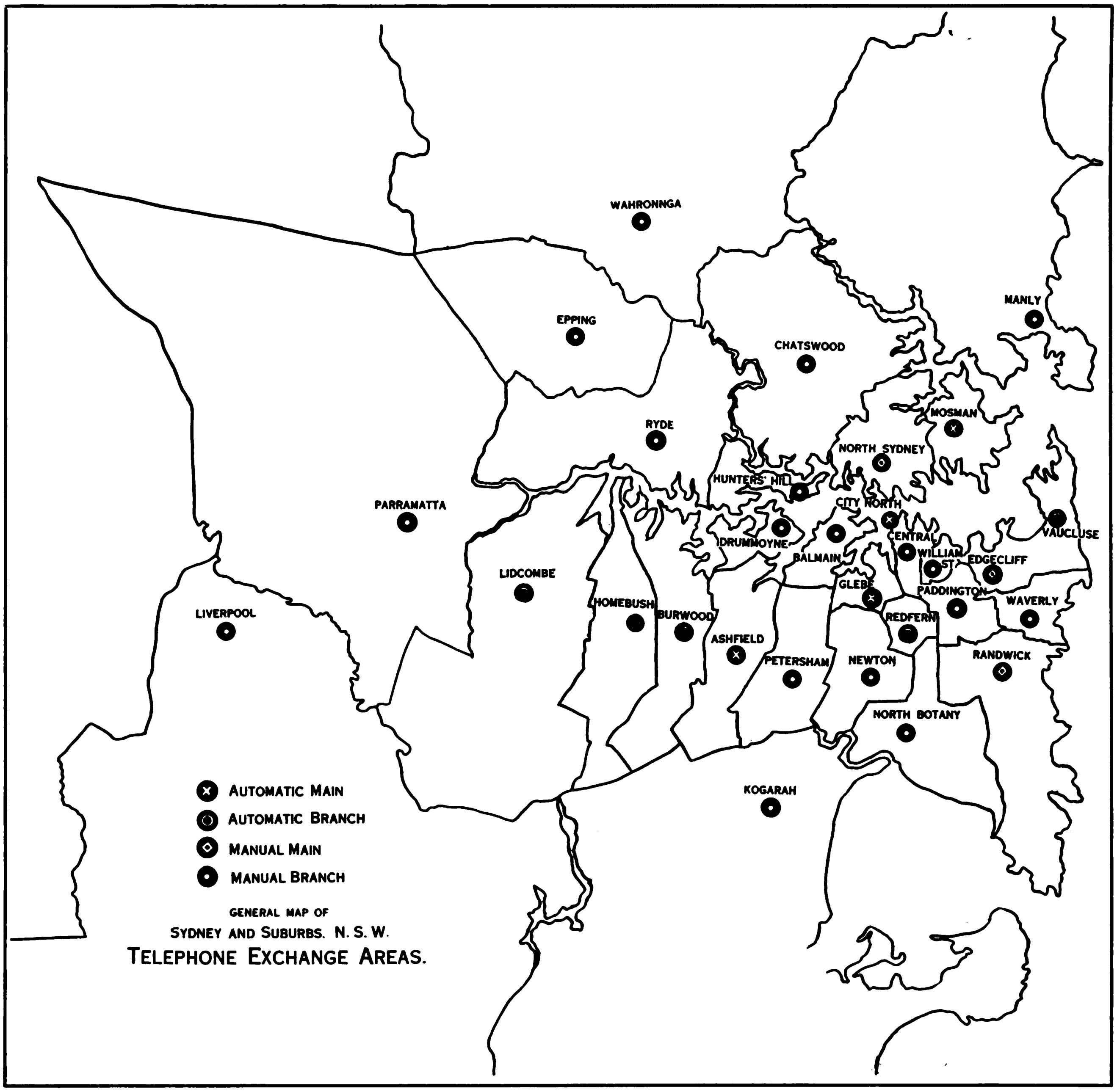
Each branch office is equipped with switching selector repeaters, third selectors and connectors, the selector repeaters switching on the second digit of the call number. The first and second selectors are all in the Ashfield office.

A branch office making a call to another branch office within the same area, uses a trunk to the main office and another to the desired branch office. In the case of a call to the Liverpool office, which is manually operated, a predetermined number having the Ashfield prefix as the first digit, is dialed and a manual operator at Liverpool is signalled from the banks of the third selectors at Ashfield.

All calls originating at Liverpool for other offices are handled manually through City office, and are completed manually in the usual manner when terminating in other manual offices, and set up by means of keyboard calling devices in City office when terminating in any automatic exchange.

Liverpool then, may be considered a branch of Ashfield as far as incoming calls are concerned, but a branch of City for originating calls: This is one of the many peculiar features of the Sydney network, and incidentally it emphasizes the flexibility of automatic in meeting such peculiarites. Calls originating in the Liverpool office might be set up by dials on the "A" positions, but the Post Office engineers in Australia have not approved of this method. A further consideration is the distance from Liverpool to Ashfield, about twelve miles.

The area just described is the most highly developed in the entire network. The North Sydney area is a typical example of another interesting type. In this district, North Sydney is the main office and Chatswood and Wahroonga are the branches. Chatswood is automatic while the others are at present manually operated.



GENERAL MAP OF
SYDNEY AND SUBURBS. N. S. W.
TELEPHONE EXCHANGE AREAS.

Chatswood is equipped with trunks to all main offices, and the first and second selectors which would ordinarily be placed in North Sydney are temporarily placed in the Chatswood office. The branch office in this case is thus operating as a main office without branches, and all manual calls originating in the other offices in the area are completed through the City office. Calls originating in Chatswood for North Sydney are trunked to North Sydney from the banks of second selectors.

In the Balmain area, the main office (Balmain) is automatic, while the branches, Hunter Hill, Drummoyne, Ryde and Epping, are manual. Calls to the main from each branch are trunked from second selector levels, while calls from the manual offices must all pass through City exchange.

It can be seen, then, that we have three types of areas in the Sydney network: first, Ashfield, having an automatic main with automatic branches; second, North Sydney, having a manual main with an automatic branch; and third, Balmain, having an automatic main and manual branches.

We have seen that all calls from one automatic office to another are handled entirely automatically; that all automatic to manual calls are completed by dialing predetermined digits which switch the calls to a manual "B" board in the desired exchange if it be a main, in the main exchange if the desired office is a branch and the main is manual, or in the branch office from the banks of second selectors if the main office of the area is automatic; and that all calls originating in a manual office to be terminated in an automatic office, pass through City office where a "B" operator completes the call with a push button calling device.

Special service calls, such as wire chief, information, complaint, fire, reverting calls, etc., are directed through the levels of second selectors to the proper desks. Information and complaint calls are trunked direct to City office, while wire chief, fire, reverting calls and similar numbers are directed through special third selectors, using three digit call numbers.

It will be recalled that in the first part of this paper, it was said that the first or "A" level of first selectors

(*Continued on page 91*)

# The Strowger Automatic Exchange at Redwood Falls, Minn.

*Describing the Application of Automatic Equipment in an Unusual Small Town Network, Involving Local, Rural and Long Distance Service*

Top Left: The New Building of the Redwood Falls Electric Telephone Company. Top Right: Automatic Switchboard and Power Board. Below: Selector Bays and Main Frame.

THE fitting of automatic equipment to the requirements of telephone companies serving small towns is usually quite a simple matter, calling for only the simplest and least expensive type of apparatus, arranged in the combination best fitted for the amount of traffic and the types of service usually required in such communities. At various times, however, the manufacturers of automatic equipment are called upon to show how the advantages of automatic operation can be applied in certain small towns, where the operating or service conditions are such as to raise a doubt in the mind of the operating manager, as to whether automatic is the right kind of equipment for his particular exchange. In every case encountered so far, it has been a fairly simple matter to "prove in" automatic equipment, from the standpoints of both service and economy.

The automatic exchange operated by the Redwood Falls Electric Telephone Company at Redwood Falls, Minn., is one such case. This exchange was cut over to automatic a little more than a year ago, and the records it has made since that time have been such as to elicit many favorable comments both from the subscribers and those who own and manage the property.

Among the unusual features of the exchange in this city, are the provisions made for furnishing city automatic switching facilities for the rural subscribers of a mutual company, and for the connection of either city or rural stations to the long distance lines of the Tri-State Telephone and Telegraph Company.

Just previous to the installation of the automatic equipment, the Redwood Falls company erected a new building. The switching cabinet of the mutual company was moved into the new building, together with the automatic switchboard. The Tri-State toll cabinet, although in the same town, is not in the same building that houses the Automatic exchange.

In order to extend some of the benefits of automatic service to the rural subscribers, the rural switching cabinet has been equipped with a dial. In this way, all calls from rural to city subscribers are completed automatically by the rural operator, thus furnishing a more rapid and economical rural service than would otherwise be possible.

Calls between city subscribers, of which there are about 400 on individual lines and 200 on two-party lines, are full automatic. For city to rural calls, the calling subscriber dials "9," which extends his line to the switching cabinet of the rural operator, who completes the connection manually. Calls from toll to rural are extended to the rural operator in a similar way by the Tri-State toll operator, whose desk is equipped with a dial. Outgoing toll calls from city subscribers are made by such subscribers dialing "O," thus extending the connection to the toll operator. Outgoing toll calls from rural lines are extended to the toll office by the rural operator.

The entire management of the local exchange, including inside and outside maintenance, is in the hands of one man, Manager W. A. Keil. During the day, a clerk is on duty to handle calls of a miscellaneous character, such as information, complaint, etc., as well as billing and other clerical work.

At night the automatic exchange is entirely unattended except for the rural operator, who takes care of any special emergency calls at that time. If the rural operator's cabinet was located at some distant point, it would be entirely feasible to lock the automatic exchange up at night, after arranging connections, so that special calls would be directed to the manager's home. However, in this particular case, such a procedure is unnecessary.

In this way, the Redwood Falls city exchange is operated with a staff of only two people—the manager and clerk; or one employee for each 300 telephones. Before the installation of the automatic equipment, the staff consisted of the manager and clerk, and five operators.

## From a User of Automatic

ALL progressive telephone men will be interested in an opinion recently rendered by a comparatively new customer of Automatic Electric Company. The manager of this company, having heard that a neighboring company was contemplating installing automatic switchboards in some of his exchanges, wrote a letter, entirely without solicitation, commenting on his experience with Automatic central office equipment.

The letter reads in part: "We have just cut over the fourth automatic equipment in our territory, and we are very much pleased with the results that we are obtaining from the C. A. X. switchboards furnished by the Automatic Electric Company.

"While these equipments are a little expensive in first cost, yet it enables us to take care of the small exchanges giving continuous night and day and Sunday service, at a minimum cost for operation, trunking from these equipments into a nearby operating center. We believe we have been very wise in our decision relative to the installation of automatic.

"We have the equipment for two other exchanges which will be installed within the next forty days. These two equipments will make six automatic exchanges out of our seventeen."

## Four Years of Automatic at York

ABOUT four years ago, the York Telephone and Telegraph Company, which operates a network of exchanges throughout York county, Pennsylvania, announced its intention of installing Automatic equipment in its exchanges in the city of York, where the headquarters of the company are located.

At that time probably the chief moving force in the adoption of automatic was the severity of war time conditions. Operators were scarce or had to be highly paid; the telephone traffic of the community increased, both in number of stations and in the number of calls per station; and as a natural consequence of these things, service suffered as well.

It had always been the endeavor of the company to give its subscribers adequate and acceptable telephone service, but this policy seemed to be in danger of becoming impossible, despite the best efforts to continue it. An investigation of the results accomplished in other cities by automatic was made, resulting in the inevitable decision to install automatic at York.

The manual operating conditions that made the installation of automatic equipment necessary then, are not now so severe. Operating costs are perhaps not quite so high, the labor turnover not quite so great, and the service conditions somewhat less severe.

In spite of this, the York Telephone and Telegraph Company are more thoroughly sold on automatic now than at any previous time. Their experience of the past four years has demonstrated that they never again need fear a return of a time of high labor costs, a traffic too heavy to be properly cared for, or unsatisfied subscribers; automatic has eliminated all these once and for all.

The service the company is now rendering to its York subscribers is regarded as eminently satisfactory in every way, and its operating costs have been stabilized at a low point.

Mr. George B. Rudy, Senior, is General Manager of the York Telephone and Telegraph Company, and his son, George B. Rudy, Junior, is General Superintendent. Ivan Baker is in charge of plant.

## Prepare for Coming Convention Season

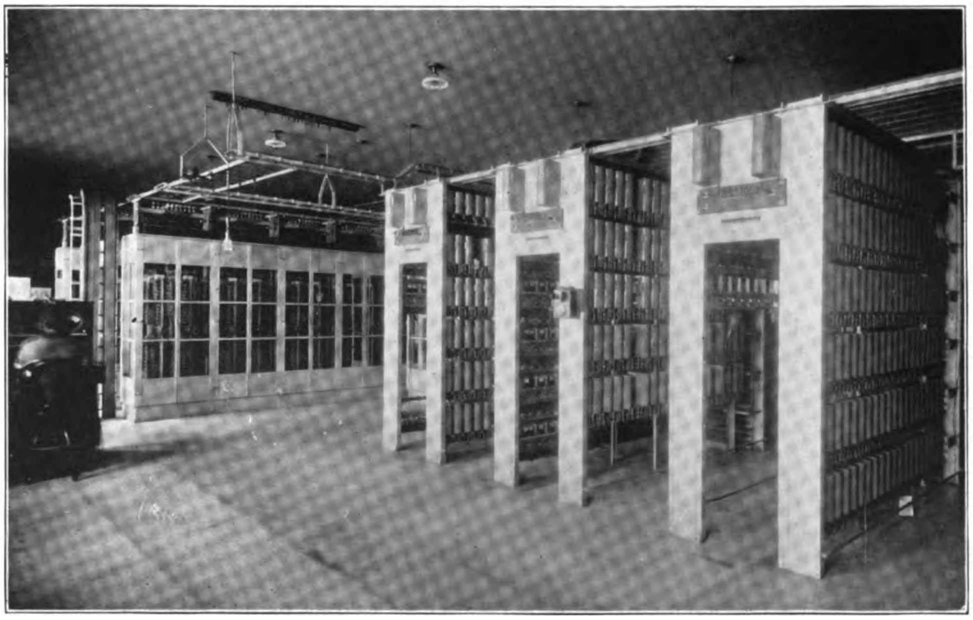
PLANS are already well under way for several of the telephone conventions of the season of 1922-23. Among those of which the dates have already been announced are the following:

Indiana Telephone Association, Claypool Hotel, Indianapolis, September 20 and 21, 1922.

Illinois Telephone Association, Jefferson Hotel, Peoria, October 3, 4 and 5, 1922.

United States Independent Telephone Association, Sherman Hotel, Chicago, October 24, 25, 26 and 27, 1922.

Independent Telephone Pioneer Association, Sherman Hotel, Chicago, October 26, 1922.



**The Automatic Switchroom at York, Pa.**

Automatic Telephone

*A Journal of Information for the Telephone Profession*

Issued Monthly by
AUTOMATIC ELECTRIC COMPANY
CHICAGO, U. S. A.

H. E. CLAPHAM :: Editor

*This publication will be sent without charge to all interested persons upon request*

## Some Experiences of an Automatic Operating Company

THE buying of central office equipment has always been a matter calling for the most serious consideration of telephone managers, more so in recent years than at any previous time.

It is becoming more and more difficult a matter to decide which type, out of the many that are available, will be the best for the particular exchange under consideration, from the standpoints of service, economy, length of life and obsolescence. The manager who precedes his decision with a very careful investigation of the records in actual operating experience of these many types, exercises the utmost wisdom.

It is a significant fact that it is only by means of the above process that new customers for Strowger Automatic equipment are made. A telephone manager who has been accustomed to the use of manual equipment may replace his worn out or outgrown switchboard with any one of several types of manual equipment, without anything more than a superficial study of its features.

But for a company to change from manual to automatic operation with no more than a casual study of the theoretical accomplishments of automatic switchboards, is a thing that we neither expect nor wish. We want every purchaser of automatic equipment to know exactly what he is getting, and we want him to know that there is no Automatic switchboard in service today, of the records of which we are not proud.

Speaking of investigations of automatic exchanges, a letter recently received at the offices of Automatic Electric Company, tells of some interesting facts that resulted from just such an investigation. The company concerned has been operating automatic equipment since about 1910.

"In 1909," says the manager of this company, "it became necessary for us to enlarge our central office facilities, and as we were then equipped with a magneto board it was decided that the change must be to another type of equipment. A great deal of investigation was made, and a number of visits paid by committees representing the directors, to other cities of about the same population as this, to inspect the different types of equipment in use at those exchanges.

"Among the places visited were two automatic exchanges, and the service rendered by these exchanges appealed to some of the committee, but the cost of automatic installation being greater than manual almost decided in favor of the manual equipment; and, but for the insistence of one man on the committee who had become somewhat out of patience with operators, manual equipment would have been installed. But this one man saved the day; we are now fully automatic, and there is not a director or stockholder of the company that has a single regret that the decision was made as it was."

The original automatic switchboard installed by this company consisted of eight individual line units and two party line units of 100 lines each. Since that time there has been added two more individual line units and a rural unit. At the present time they are operating more than 3000 automatic telephones and no manual stations whatever.

The original units have been in service for nearly twelve years, and are apparently in as good condition now as when first installed. Credit for this is given largely to the fact that the routines recommended by Automatic Electric Company have been closely followed all the time.

As to the opinion of the company and subscribers concerning automatic operation, we can do no better than quote from the letter previously mentioned.

"There is no one," it reads, "connected with the company either as stockholder or employee, who would consider any other kind of equipment. I think our subscribers are as well pleased with the service they receive as the company is; in fact, I have never yet heard one of our subscribers express a desire for a different type of service, and I can recall many expressions of great satisfaction. The most emphatic are from persons who, accustomed to automatic service, change to a location where some other kind is rendered, and then return to be our subscribers."

"I am not at liberty," says this manager, "to make public the details of the company's financial experience. But I might say that when the original automatic installation was made, the matter of financing the job was very difficult due to the prior record of the profits returned to investors in telephone stocks; but at the present time that condition does not exist, and the financial standing of this company is of the very best.

"I feel that this is largely due to the economy possible in operating an automatic plant; our plant has not been starved, for it is in better than average condition for a plant eleven years old. Our scale of wages compares favorably with other companies under similar working conditions, and our rates are not high. In fact, ours is one of the few companies that did not find it necessary to increase their rates during the war.

"The directors have so much confidence in automatic service that, two years ago, they authorized the installation of a rural automatic board, and we changed our rural subscribers from manual to automatic. Prior to this change we had service complaints all the time, and rebates were the rule, not the exception. Since automatic has been installed, we have no rebates and service complaints have been reduced to a minimum."

* * *

There is nothing that we, as manufacturers of Strowger Automatic equipment, can add to the above letter. We could fill several pages in elaborating upon theoretic reasons for the service and profit value of this equipment, but it would not be worth nearly as much to the prospective user of automatic as the simple statements made above. The gentleman who wrote the letter knows automatic equipment by having lived with it and worked with it year after year, not through hearsay or through information received from us. Can there be any better proof of the economy and service that comes with the operation of automatic?

## Sydney's Automatic Network

(*Continued from page 87*)

was assigned to Randwick office, and the "O" or "Y" level was assigned to Mosman. It is now the general practice to reserve the "O" level for the "zero" operator or toll recording operator, and to leave the first level unoccupied.

In the introductory paragraph, the statement was made that in the early stages of the development of the Sydney network, all lines were operated on a flat rate basis. With the introduction of automatic equipment, call meters were provided for every line, such that all completed calls were registered. To effect this, each line in the office was equipped with a registering device, which was operated to register one call, each time a call was completed, under the control of a pair of relays placed in each trunk between the primary and secondary line switches.

The exact number of lines with which each automatic exchange is equipped is not known, since our representatives in Australia have placed orders for equipment without specifying in which offices it was to be installed. The following list, however, is approximately correct, and will give a good idea of the extent of the present system:

| | | Lines | | |
|---|---|---|---|---|
| Office | Type | Single | Party | P. B. X. |
| Ashfield | Main | 2100 | 100 | 100 |
| Parramatta | Branch | 800 | 100 | 100 |
| City North | Main | 4600 | 2000 | 100 |
| Homebush | Branch | 900 | 100 | 100 |
| Mosman | Main | 2300 | 100 | 100 |
| Glebe | Main | 1600 | 100 | 200 |
| Newton | Main | 1800 | 100 | 100 |
| Lidcombe | Branch | 400 | 0 | 100 |
| Chatswood | Branch | 300 | 100 | 100 |
| Burwood | Branch | 1400 | 100 | 100 |
| Balmain | Main | 1900 | 100 | 100 |
| Vaucluse | Branch | 300 | 100 | 400 |
| | | 18400 | 3000 | 1600 |

## C. A. X. Installed at Tyndal, S. D.

THE Dakota Central Telephone Company, in several of whose exchanges, automatic equipment has been used with the greatest success for several years, has recently converted another of its exchanges. Tyndal, S. D., is the latest addition to its list of automatic exchanges.

*All Indiana Telephone Men should see the*
Strowger Automatic Exhibit
*at the Convention of the*
INDIANA TELEPHONE ASSOCIATION
CLAYPOOL HOTEL, INDIANAPOLIS SEPT. 21-22, 1922

This exchange is of the simplified C. A. X. type, having a capacity of 300 lines, including individual lines and harmonic party lines.

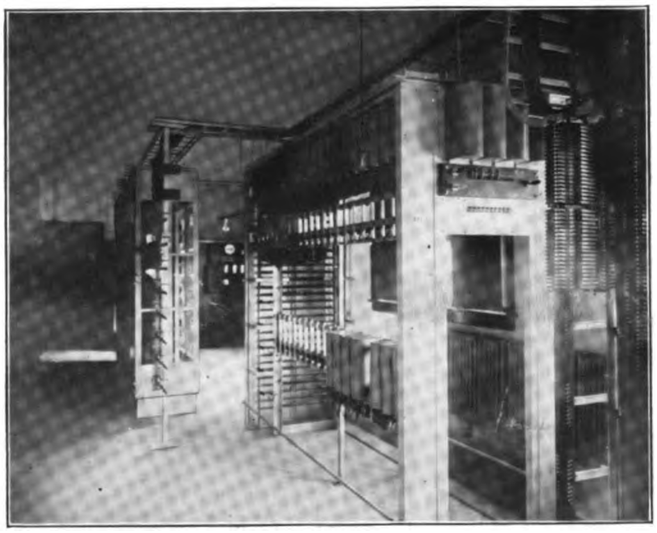
The line switch equipment is of the rotary type, mounted on swinging shelves as in larger exchanges, but the installation as a whole is designed to be unattended, except for periodic visits for purposes of inspection and routine adjustment.

This latest addition to the Dakota Central group of Automatic exchanges is more than usually gratifying in that it speaks well for the success of previous installations. This company began the use of Automatic equipment in 1912 when the exchanges at Aberdeen and Mitchell were converted. In 1914, the 1,000 line exchange at Watertown was converted. Preparations for the conversion of the fifth exchange, at Pierre, (500 lines) are well in hand, and will be completed soon.

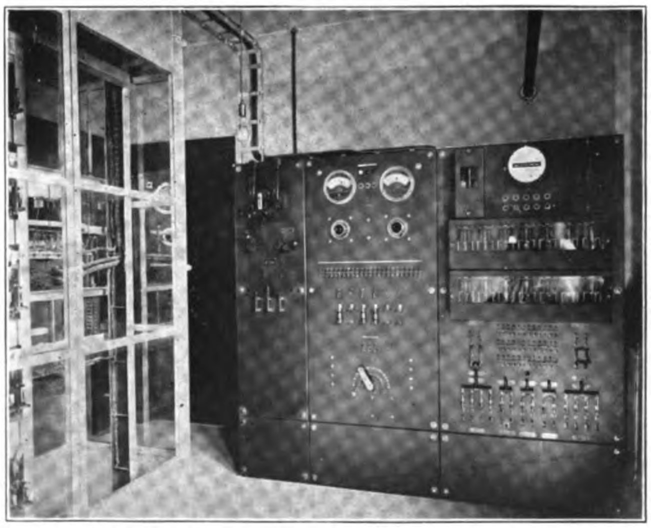
## R. R. Stevens of Tri-State Company Resigns

MR. ROLLO R. STEVENS, for many years Commercial Superintendent of the Tri-State Telephone and Telegraph Company of St. Paul, has resigned, effective August 1st. Mr. Stevens has been concerned with the selling of telephone service for a great part of his life, and during the past seven years has been connected with the commercial departments of various telephone operating organizations, first in Ohio, and then with the Tri-State company.

Mr. Stevens will be succeeded by Mr. R. F. Wilder, formerly Commercial Engineer. Mr. Wilder has been with the Tri-State company for twelve years, for three of which he was assistant to the commercial superintendent, and was therefore Mr. Stevens' logical successor.



**C. A. X. Equipment at Tyndal, S. D.**



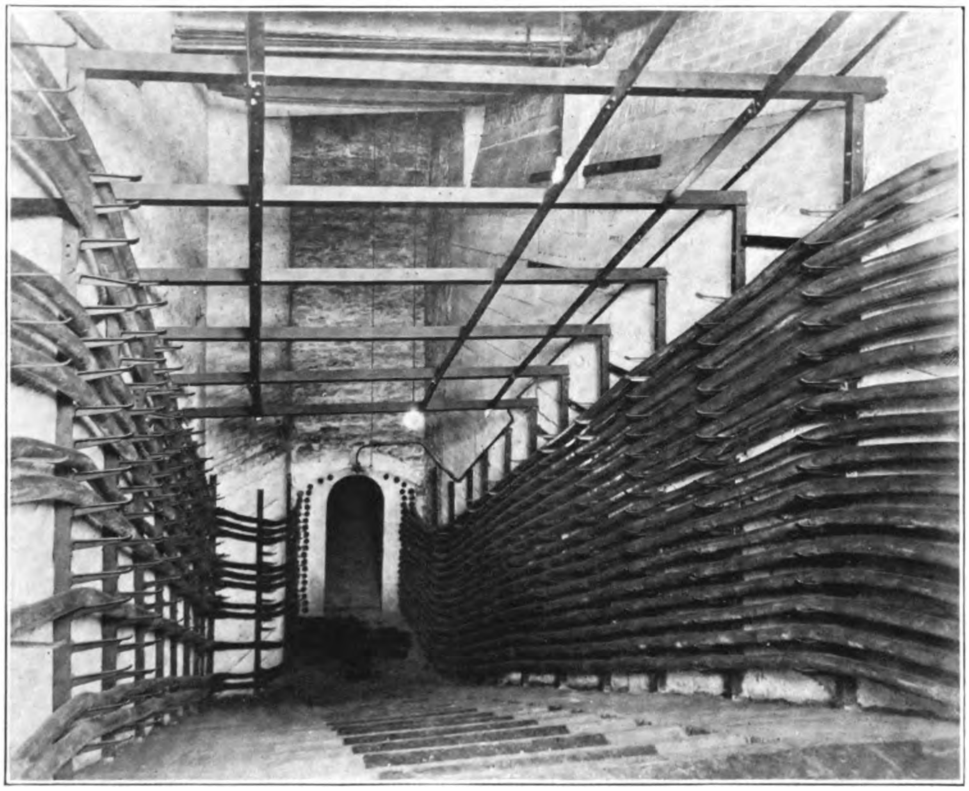
**The Tyndal Power Switchboard**

# St. Paul's Cable Tunnel

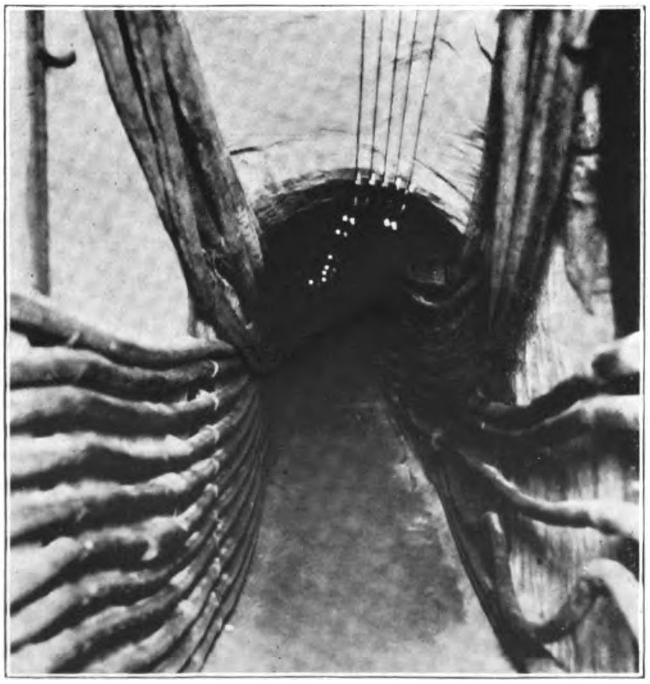
### *The Tri-State Telephone and Telegraph Company's Tunnel, Carved Under the Downtown Section of St. Paul, is a Unique and Interesting Piece of Telephone Construction*

IT is safe to say that, of the many things that go to make up a complete telephone exchange in any city, the cable plant is the one that the average telephone subscriber knows the least about. He knows something about the telephone instrument in his home or place of business, because he uses it every day. He knows less about the central office equipment, because he seldom sees it; but he does know in a general way what is accomplished there, and therefore appreciates its existence. But of the hundreds or perhaps thousands or hundreds of thousands of connecting links between the telephone instruments and the central offices, and those between the various central offices, he knows little or nothing.

Perhaps, if he is reminded, he is able to recall in a very hazy way, a time when the space above the streets was thickly criss-crossed with wires, and when telephone poles were more plentiful than street lamps. When they disappeared he cannot say. If he is asked where the wires are now he will be quick to reply that they are "somewhere underground," but just how they were placed there, and of what problems confront the telephone company in so placing them that they may be used to the greatest efficiency, he is entirely ignorant. Yet this work is just as important a part of the development of any city as the construction of boulevards or the development of transportation.



**The Approach to the St. Paul Cable Tunnel**



**A View Within the Tunnel**

One of the most interesting pieces of telephone history relating to the above subject is represented by the tunnel owned by the Tri-State Telephone and Telegraph Company of St. Paul, two photographs of which appear on this page.

## POLES BANNED

Back in 1890, when the plans for this tunnel were first drawn up, underground cable construction was in a very hazy state of development. There were no standard methods, and one that could properly be called the best. At St. Paul about this time, the city officials decided to exclude all telephone poles from the downtown section. Accordingly, telephone engineers began experimenting to find out what would be the best way to lay the telephone cables under the streets of St. Paul.

Here arose a rather complicated question. The downtown section of the city rested on a hard sandstone shell, so that to begin surface excavation would have been difficult and expensive. However, it was found to be comparatively easy to dig a tunnel some distance below the surface, since the rock formation was much softer there. After much investigation, it was found that this offered the most permanent and convenient method of providing a channel for the cables.

### PROVED DURABLE

That the results of the investigation were entirely justified is shown by the fact that, in spite of the apparent softness of the sandstone, there has never been a cave-in or other mishap, and the condition of the tunnel is just as good as ever and bids fair to be entirely permanent.

The work of excavation was commenced almost immediately by John Lind of St. Paul, and was continued over a period of about ten years, the tunnel being completed as it is at the present time in 1900.

The total length of the tunnel is a little more than four miles; the average height is six feet, and the average width three feet. The total cost of excavating was $76,027.46, and the total cost of completion, including the brick work, laying racks for cables, etc., was $94,035.43.

The tunnel at present houses about 120,000 feet of cable, the sizes of which range from 50 to 1,200 pairs. Its ultimate capacity is practically unlimited. It is electrically lighted for about two miles. The tunnel turns west under Fifth Street near the telephone building, and follows this route as far as Smith Avenue. It runs from the Mississippi River on Wabasha Street to College Avenue; there is another running west on Fourth Street as far as Seven Corners, and from here it runs along Seventh Street to Banfil Street. Another branch runs from Sixth and Wabasha Street to Ninth Street and Main Avenue. At one point an entrance makes connection with the State Capitol.

### MANHOLE CONNECTIONS

The cables are connected to other cables above the ground through manholes at certain locations, and in this way the wires are distributed to different buildings and telephone stations. From the tunnel, the cables run into the Cedar exchange into the terminal room, where they are distributed to the switchboards.

Visitors to the plant of the Tri-State Telephone and Telegraph Company at St. Paul find the cable tunnel a source of never-ending interest, and it is regarded as an important historical feature in St. Paul's telephone development.

# A Model Telephone Plant

## *Some Interesting Paragraphs Describing the Up-to-Date Telephone Plant of the Marion County Telephone Company at Marion, Ohio. Reprinted from the Recent Centennial Edition of Marion Daily Star*

TELEPHONE service in Marion and surrounding territory centers about the model plant of the Marion County Telephone Company, No. 197 South Main Street. The company, which is a strictly locally owned corporation in which there are interested more than 100 Marion stockholders, today is operating one of the most modern telephone properties in the country.

### AUTOMATIC SERVICE

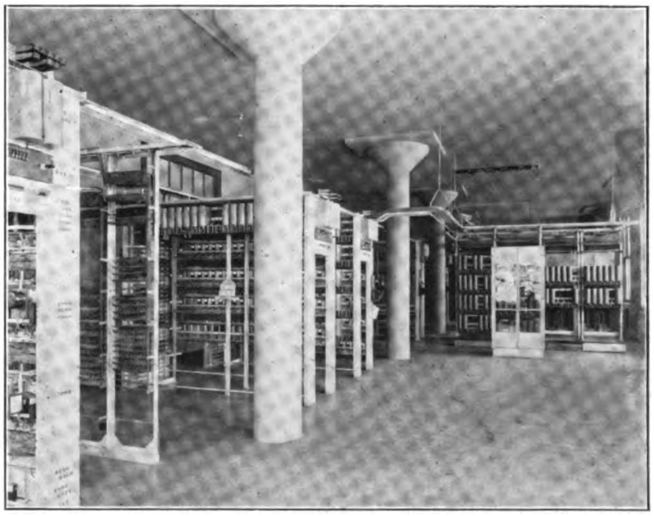
Automatic telephone service was established in Marion and the surrounding farm territory in 1917, when Automatic Electric Company of Chicago installed the model plant. Since its completion the plant has been visited by telephone engineers from all over the United States, as well as by government engineers from many European and South American countries.

In the Marion plant alone there are nearly 20,000,000 calls made every year over the automatic telephones. There are in service nearly 7,300 telephones, which will average nine calls a day for every day in the year. The company has in operation in its system more than 13,000 miles of wire, 6,400 of which are in aerial cable and 6,000 miles in underground cable.

During the past year the company installed 1,049 telephones, moved over 1,000 to make a net gain of 229 subscribers. The monthly payroll is more than $9,000 and the average number of employes is fifty-one, sixteen of whom are toll operators.

### RECONSTRUCTION

The company is replacing its overhead wires with underground construction just as fast as its finances will permit. Every year an extension is made to the underground system in some section where overhead construction is the heaviest. The future aim and desire of the company is that within a short period of years all aerial construction on the principal streets will be replaced with underground construction, which not only will add to the appearance of the thoroughfare, but add materially to the quality of service.



**Marion's Automatic Switchroom**

Officers of the company are F. E. Guthery, president; S. E. Barlow, vice-president, and A. J. Berry, secretary-treasurer and general manager. With these officers, W. G. Harding, H. B. Hane, D. R. Crissinger, John A. Schroeter, Frank Huber, J. F. Prendergast, A. E. Cheney and J. G. Leffler constitute the board of directors.

# Philadelphia's Automatic Service

### *Some Extracts from a Recent Publication of the Keystone Telephone Company, Describing Some of the Things Automatic Equipment Has Accomplished in the Way of Better Service for the Telephone Users of Philadelphia*

THE Keystone Telephone Company of Philadelphia, whose six exchanges in that city were converted to automatic working a little more than a year ago, has just published an interesting little booklet, telling of the facts that led up to the adoption of automatic equipment, and describing the improvements in service that have resulted from its use.

The following paragraphs taken from the booklet form an interesting exposition of the vast difference between automatic and manual service, and are all the more interesting because they have been written as a result of actual experience with automatic equipment:

"There has been an entire change in the Philadelphia public attitude toward the use of telephones brought about by the Keystone Telephone Company's installation of the automatic operating system. The once familiar lack of confidence in the telephone, the long waits, the distrust of the human connecting operator, the dread of cut offs and other interruptions, the anxiety for want of essential secrecy, have vanished. Those who heretofore hated to use a telephone with the old system, and did so only under the pressure of necessity, now turn freely to the automatic device and dial with the satisfactory certainty of quick, accurate, secret and uninterrupted results. What was once a distressing task has become an agreeable, almost fasinating, operation.

## EXHAUSTIVE INVESTIGATION

"A long and exhaustive study by our engineers of automatic telephone operation was concluded in the summer of 1919. The report made to the Board of Directors presented the definite conclusion that not only was the automatic system of communication the most practical and efficient that had ever been conceived but that its adoption by all forward looking companies could only be a question of time, dependent solely on ability to provide the necessary funds to secure the equipment.

"Eventually the public demand would force it upon even the most reluctant. Our Board of Directors were quick to act. They adopted the report and took immediate steps to carry it into effect. Arrangements for financing and manufacture of the mechanism were completed within a few weeks.

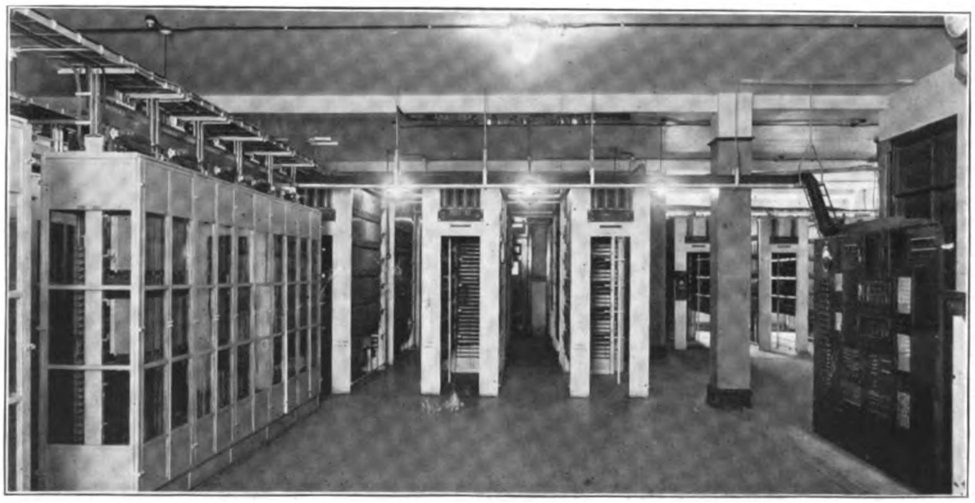
"The work was completed on May 14, 1921. Up to 10 o'clock on the night of that day the Keystone System continued in operation by means of the old-fashioned manual switchboards and girl operators. Within about seven minutes after that hour the magic cut over was successfully accomplished. The girl operators were turned to other tasks, the old switchboards became little more in value than junk and thousands of messages were passing over the Keystone network of wires aided only by the mysterious and marvelously efficient automatic switches.

## TROUBLES BANISHED

"The aggravations of the old telephoning method were manifold. Many times you had to wait your turn with a too busy central office operator. Too often it was an indifferent and slow moving one that held you in suspense with the receiver at your ear. When your call had to pass through two exchanges then you had to deal with the failings and eccentricities of more than one operator and your troubles correspondingly multiplied. Your patience escapes these waiting trials with the automatic system. There is nothing to wait for. You make several quick turns of the dial, the electrical impulses pass instantaneously, and you hear the bell ringing distinctly at the called person's telephone station. It is as quick, as weird, as the flash of lightning.

"Innumerable times probably when making a call you have had the experience of passing through the seemingly interminable waiting periods only to find when the connection is finally established that you have the wrong number. That is one of the inevitable and chief failings of the old way. Perhaps the operator had misundertood you. Perhaps she had tangled the number in her own mind after she received it. More than likely she had made a false move with one of the many plugs and jacks that she manipulates hour after hour. Mistakes and confusion come to the best operators at times. That is the human element.

"When the unfortunate victim of the manual system finds himself at the wrong telephone destination, he has to retrace his steps, summon the operator once more and begin all over again, not certain even then of any better result. With the automatic device you will not get a wrong number if you dial the right one. A



**The Main Office Automatic Switchboard at Philadelphia**

precisely working little machine has been substituted there for the vagaries of the human hand and mind.

"When you have finished one call on the manual system it is hopeless to expect to make a new one quickly. The method of operation is such that it is almost never accomplished with efficient promptness. You cannot make a new call until the operator disconnects the old one. Probably you have a lot of calls to make and time is precious to you but that makes no difference. You are helpless and must wait.

"But if you have Automatic service the moment you hang the receiver on the hook the disconnection is instantaneous and complete. You are at once ready for another call. If you want even to recall the party you were just talking to—perhaps you have suddenly thought of something additional to say—you can do it with the utmost ease. You can make two or three calls with the dial in the same time it would take to make one on the manual.

"There is a well known club that notifies its several members by telephone of the day and hour set for monthly meetings. Under the old manual method it took a man practically all day to make these calls. Automatically he does it all in a little more than three hours.

"You never had much confidence in the manual operator's report that 'The Line is Busy.' The reason for your lack of confidence was that you never were certain that the operator had called just the number you asked for. She might easily by mistake have tested the line of one of the hundreds of other subscribers within her reach and found it busy and so reported to you. Or when she reported 'They don't Answer,' you were never satisfied. You knew always that there was a strong possibility that the number reported was not the number you wanted.

"With the Automatic telephone if you dial correctly you instantly hear the bell ringing in the wanted party's station. You are confident it is ringing right there and if there is no answer you are satisfied that there is no one on hand to respond. If you dial right you instantly reach the wanted line and if it is busy you hear the 'busy buzz' and have no misgivings as to the correctness of the information so given you. You wait a minute and to try again is quick and easy.

"There is occasionally the unthinking man who says he likes the old-fashioned system because he can 'talk to the operator.' He forgets that his real purpose in having a telephone is not to talk to the operator but to reach other subscribers and to reach them in the quickest and most direct manner possible. The automatic telephone does away with the now wholly unnecessary intervening operator agency. If your telephone is out of order or there is other necessity for complaint Dial Race 03. You can thus still 'talk to the operator' should an emergency arise."

**The Manual Desks, Associated with the Keystone Company's Automatic Network, Are Centralized in This Splendid Room in Race Office**

## First Canadian Made Strowger Exchange Being Installed

ALMOST two years ago, arrangements were completed whereby the manufacture and sale of Strowger Automatic equipment to telephone organizations in Canada were taken over by the Northern Electric Company of Montreal. Now, after many months of concentrated effort in organizing the necessary staff and getting together the necessary manufacturing facilities, the installation of the first Canadian made Automatic will soon be an established fact.

The following paragraphs are taken from a recent issue of the Nor-Electric Bulletin, published by the Northern Electric Company:

"The idea of Canadian made Automatic equipment has been developed from the infancy of a mere announcement to the lusty manhood of actual production in a space of eighteen months—eighteen months of intensive study, work and progress, the fruit of which will go into the Winnipeg Fort Rouge Exchange.

"The converting of this Exchange from Manual to Automatic is being undertaken by the Manitoba Government Telephone System, which already has Automatic service in the down-town exchanges of Winnipeg.

"These Automatic Exchanges in the business districts have brought great satisfaction to the Winnipeg public and to the Manitoba telephone officials alike, through the efficiency of service and the substantial reduction in operating costs made possible by the elimination of the operator. Therefore, it was decided to extend Automatic Service to the residential area. When the Fort Rouge installation is completed, almost two-thirds of the City of Winnipeg's telephones will be Automatic.

"Some 6,600 lines are involved in the Fort Rouge installation, and it is expected that the Exchange will inaugurate its Automatic Service to the Winnipeg public early in 1923, as the first Automatic Exchange in Canada equipped with Canadian-made apparatus."

# West Pennsylvania Telephone Men Hold Enjoyable Convention

### *Summer Convention at Conneaut Lake, Pa. Reported to be a Distinct Success, Both as Social and Business Gathering. Many Interesting Papers Presented and Discussed.*

THE Western branch of the Pennsylvania State Telephone and Traffic Association reported the summer convention at Conneaut Lake, July 20-22, to be unusually interesting and very well attended. Mr. John Z. Miller, General Manager of the Mutual Telphone Company of Erie was chairman of the committee in charge.

A. O. Black, general manager of the Peoples Telephone Co., Butler, Pa., was the first speaker introduced. After a few words of greeting, Mr. Black read a noteworthy paper, and one which elicited much comment. Talking on "The Commissions and Omissions of Telephone Companies," he pointed out the necessity of giving close attention to a number of apparently little things which are frequently overlooked in the operation of a telephone plant, but which really make all the difference between success and failure.

Following Mr. Black's address, W. S. Vivian, manager of the public relations, Automatic Electric Co., Chicago, spoke on "The Purpose of the Conference." Mr. Vivian narrated the development of the telephone business from the time of the invention in 1876 to the present. He emphasized the necessity of every employe of a telephone company being able to tell the story and to visualize the business.

At the evening session an interesting demonstration on radiotelephony was given by Wm. S. Paca, manager of the Petroleum Telephone Co., Oil City, Pa. A very complete radio receiving set had been installed in the auditorium and Pittsburgh and other stations were heard distinctly. He followed this by showing a series of moving pictures describing the function of the audion, circuits and other parts of the radio set.

The banquet Friday evening at the Hotel Conneaut was one of the bright lights of the convention. It was the first banquet of the western branch of the association at which the ladies have been present and there was a unity of sentiment that it was the most enjoyable affair ever held.

The Saturday session was taken up with a talk by John H. Wright, general manager of the Jamestown Telephone Corp., Jamestown, N. Y., on "Public Relations," and an address by Perry Ballou, of R. R. Donnelley & Sons Co., Chicago, on "Standardizing Telephone Directories."

The operators' traffic conference which was a part of the convention was conducted by W. S. Vivian, of Chicago. The subjects assigned to the various operators were carefully thought out and presented in a series of helpful papers.

**A Group of "Live Wires" Familiar to All Pennsylvania Telephone Men. Left to Right: John Z. Miller and M. V. Wright, Erie; H. E. Bradley, President of the State Association; John H. Wright, Jamestown, N. Y., and E. D. Schade, Johnstown.**

**A Group of Pennsylvania Telephone Men and Operators "Taking the Air' at Conneaut Lake.**

UNIVERSITY OF MICHIGAN
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# Make Your Small Exchanges Self-Operating

PAYING operators to take care of your outlying exchanges is an unnecessary waste. The C. A. X. eliminates all regular attendants at such exchanges and their salaries become a net saving.

But installing the C. A. X. in a small town or rural community means much more than this. Here are some of the other things accomplished by its use:

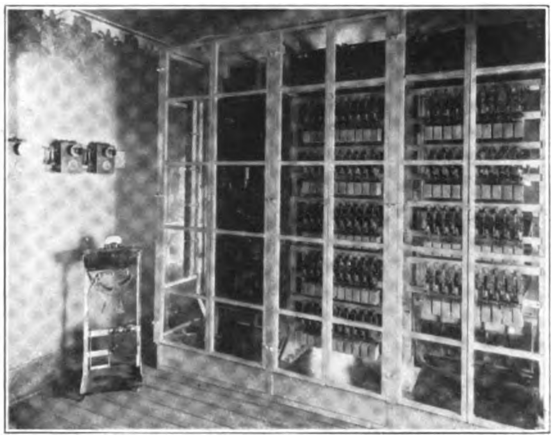
**Continuous Service**—Rapid, accurate and reliable service twenty-four hours per day.

**No dry Battery Expense** — The C. A. X. operates from a common battery power plant, automatically charged at the proper intervals.

**Positive Supervision**—The operator or maintainer at the nearest attended exchange can keep a positive check at all times on the operation of the C. A. X. By occasionally dialing a special code and listening for the alarm signal, unstandard conditions may usually be detected and corrected before the subscriber is aware of any trouble.

**Easy Maintenance**—A visit by your regular maintenance man every week or two weeks is sufficient to keep the apparatus continuously in first-class condition.

Our engineers will be glad to explain the application of the C. A. X. in any one or more of your exchanges upon request. No obligation.



## Automatic Electric Company

*Factory and General Offices:*
**CHICAGO, ILLINOIS**

**BRANCH OFFICES:**

New York City
21 East 40th St.

Cleveland
415 Cuyahoga Bldg.

Philadelphia
The Bourse Bldg.

Columbus
516 Ferris Bldg.

Boston
415 Tremont Bldg.

Rochester
Mercantile Bldg.

Detroit
525 Ford Bldg.

Washington
905 Munson Bldg.

Cincinnati
Union Central Bldg.

Los Angeles
238 San Fernando Bldg.

Pittsburgh
608 Fulton Bldg.

Kansas City
1001 New York Life Bldg.

**ASSOCIATED COMPANIES**

**International Telephone Sales and Engineering Corporation, New York**

International Automatic Telephone Co., Ltd., London

Compagnie Francaise pour l'Exploitation des Procédés Thomson-Houston, Paris

Automatic Telephone Mfg., Co., Ltd., Liverpool

Automatic Telephones, Australasia, Ltd., Sydney

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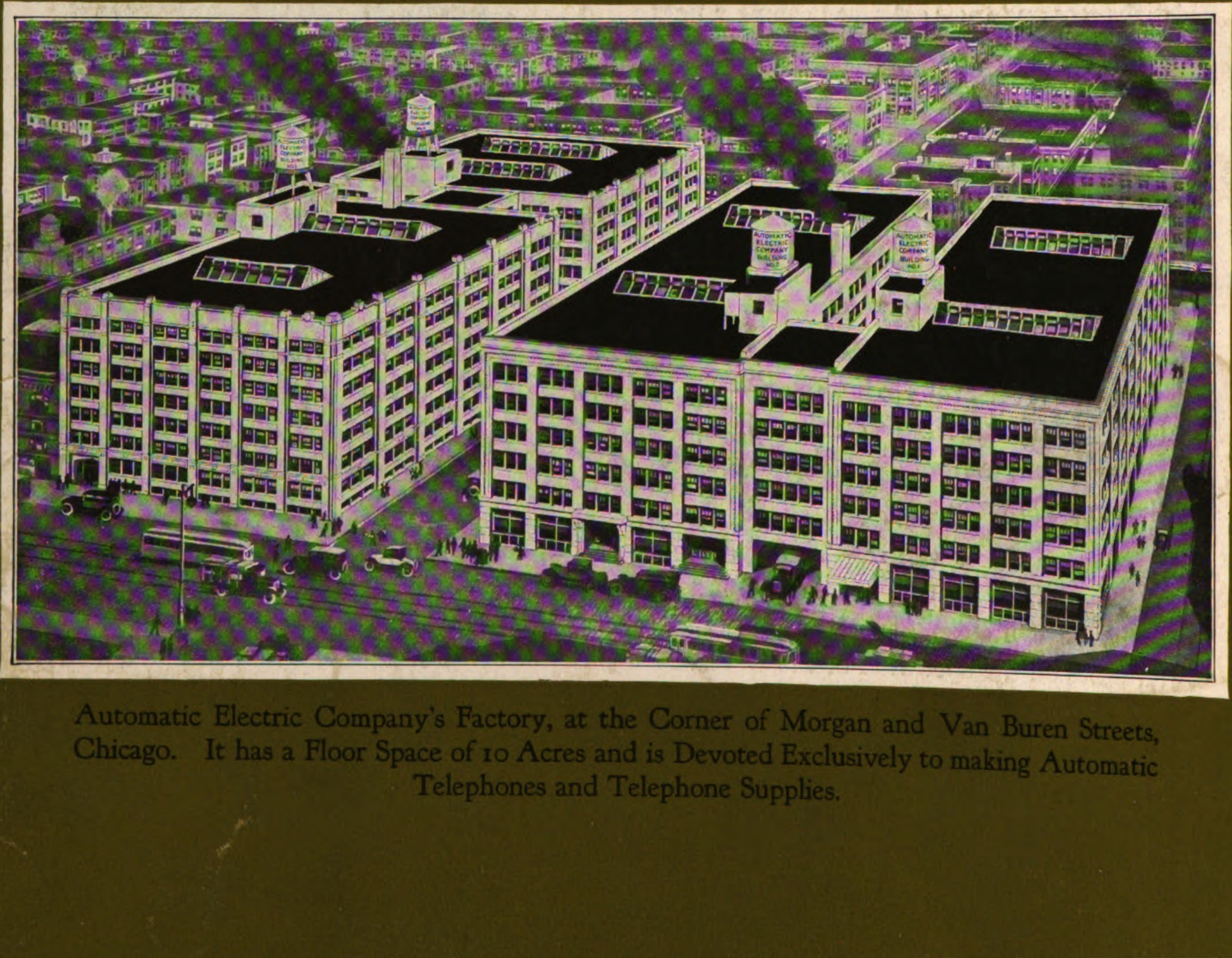
# The Home of the Automatic


AUTOMATIC ELECTRIC COMPANY BUILDING NO. 1
AUTOMATIC ELECTRIC COMPANY BUILDING NO. 2
AUTOMATIC ELECTRIC COMPANY BUILDING NO. 3

Automatic Electric Company's Factory, at the Corner of Morgan and Van Buren Streets, Chicago. It has a Floor Space of 10 Acres and is Devoted Exclusively to making Automatic Telephones and Telephone Supplies.